Gas Journal

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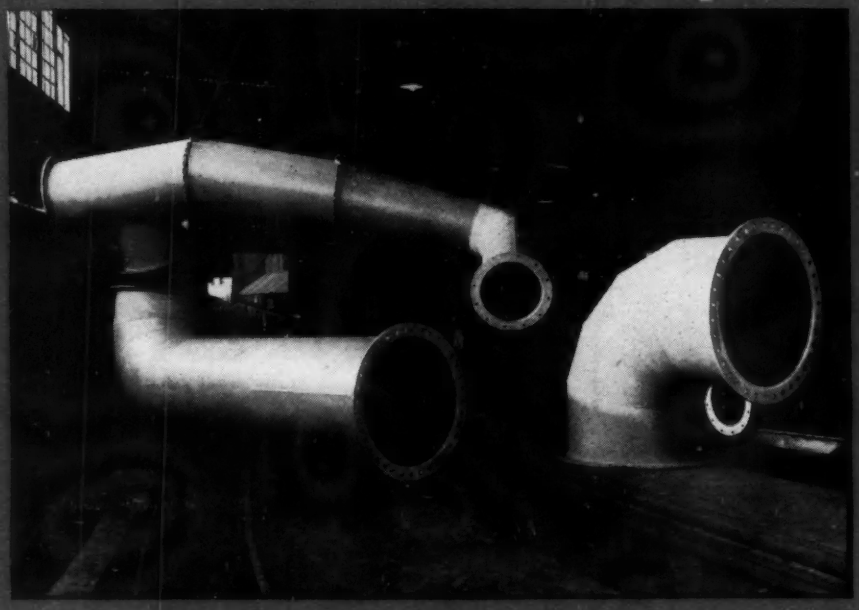

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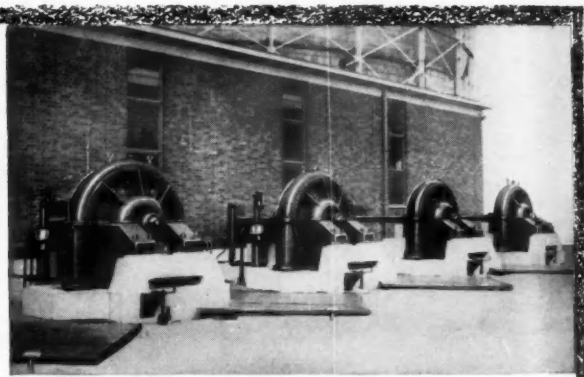

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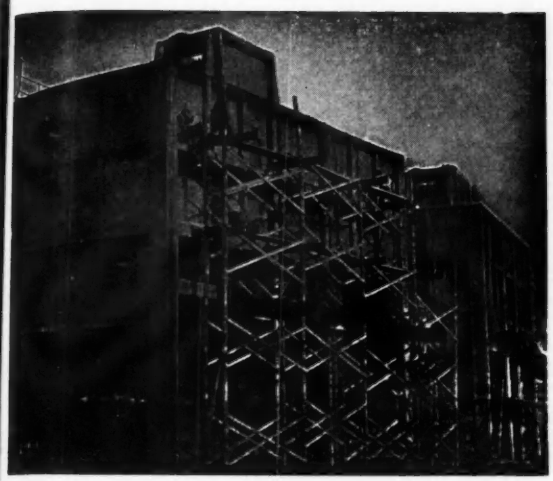

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Gas Journal

VOL. 298 *No. 5002* *MAY 27, 1959*

IIITH YEAR

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Gas Journal

VOLUME 298. No. 5002 MAY 27, 1959. 111th YEAR

More Power to its Elbow

A CRITICAL view of the present state of an industry is always salutary and will arouse deeper thinking as to how the future should be faced. If the facts, as they are, can be clearly and concisely stated, it is remarkable how easily a true picture of the conditions existing at some given moment can be visualised, points of strength or weakness seen and ideas for correcting certain tendencies put forward.

In his presidential address to the Institution, Mr. E. M. Edwards, Deputy Chairman of the Wales Gas Board, has done something of this sort by reviewing the state of the gas industry in Great Britain. Dr. Burns in his address last year traced the change in outlook that had taken place since the second world war, brought about principally by the rise in the price of coal, dearer freights and the increase in the cost of building production plants. In Dr. Burns' board's area is the biggest population in the smallest area. Mr. Edwards' board covers a large area, very sparsely populated, for which it is consequently less easy to design an all-embracing grid system supplied from a limited number of production stations. In spite of these disadvantages, the Wales Gas Board has been able to do this.

What are the factors that have enabled the gas industry to accomplish such a revolution in its outlook since nationalisation?

Mr. Edwards thinks that the vitality of the Institution has contributed greatly to this very liberal outlook. With this we would heartily agree, since looking back to prevesting days, it would seem that even then integration was in the air. The go-ahead gas companies with far-sighted engineers to direct their technical policies, must have seen the possibilities of extending their sales to their neighbour's areas of supply, but naturally the various gas acts made so easy an expansion in business impossible. In the metropolitan areas of supply, the technique of large-scale gasmaking was an accomplished fact; it needed the sweeping away of parochially-minded restrictions to open up those possibilities to far-sighted engineers all over the country.

The high standards demanded by the Institution made available the highly trained engineer for this particular task. It also makes necessary the training of the young engineer who will be able to fully exploit the new production methods being investigated and the new outlook towards mechanisation of so many tasks, which even a short time ago were done by hand. A proper grounding in the engineering principles involved and a grasp of the ideas of good leadership, these and other important qualities, Mr. Edwards lists as being needed by the young man coming forward to enter other industries as well as the gas industry.

The Institution is clearly ultimately responsible for the technological training of the young gas engineer, but in the Junior Gas Associations Mr. Edwards sees a wonderful training ground for the well qualified but perhaps yet untried engineer. Here he may well be able to put his ideas forward, either in papers or by taking part in discussions, but he must learn how to express himself in a form all will understand in the fewest possible words and perhaps in a well turned phrase. It is by taking advantage of the industry's associations, both junior and senior, in addition to the Institution itself, that the young man can qualify himself for the higher management posts which are open to any able man whatever his background. The knowledge that such jobs exist will in itself attract the ambitious young man who wants an interesting and satisfying occupation; something which will keep him on his toes and make him fully conscious that the gas industry can prove, and has proved whenever called upon to do so in the past, its efficiency as a supplier of energy.

The fact that the industry is a fuel industry and especially a supplier of a refined fuel, clearly shows both its possibilities and its responsibilities in the future. The tendency since the war to turn from the use of coal is most marked. Why should this be so? There are two explanations that immediately present themselves; first the increase in price of coal, its expensive handling, employing more labour and the accompanying dirt, and secondly, the enormous advantages to be gained from the use of refined fuels in every case.

Gas, oil and electricity immediately spring to mind as each qualifying for the foremost place in this field. But what of the raw materials for their production? Coal was and still is the traditional raw material for gas making and also for electrical generation, but both, especially the gas industry, have successfully used oil.

Oil is a competitor with each of the others in its own right as a refined fuel. What then does the future hold? At present the gasification of oil, the use of refinery gases and the importation of liquefied methane compare favourably with gas produced from coal, both in the capital cost of the plant and the actual thermal cost of the raw material, added to which there is no residual coke; the production of electricity from atomic energy would seem to be fast catching up on the generation from conventional power station processes. The general public, as we have pointed out more than once, means to have their comforts with the minimum of effort and these refined fuels will provide them; but the choice is largely a matter of cost and possibly prestige. At present gas central heating in cost of actual fuel finds its difficult to compete with oil; but when a clean sulphur-free gas from poor coal, from metallurgical coke manufacture, hydrogenation processes or methane from coal mines, is universally available, gas may well outbid oil for this and other space heating loads, provided the most efficient appliances can be cheaply produced.

The convector gas fire is a case in point. There is good evidence to believe that oil may become expensive to get before the end of the century and that natural gas will be in short supply by the 1980's, so the gas industry may well come into its own for all space heating within the next 20 years or so. It is likely that coal will once more be the raw material. Mr. Edwards calls for full co-operation between technicians, accountants and commercial men to see that the industry takes every chance that offers itself.

A Trust of Brains

MR. C. H. PURKIS, President of the London and Southern Junior Gas Association, won double honours in psychology last Friday with one brilliant idea. By streamlining the business session he was able to (a) present a highly-entertaining 'Brains Trust' comprising five eminent members of the Association, and (b) by this means gather unto him an incredibly large audience for a mere A.G.M. The 'Brains Trust' of five were Mr. L. W. Andrew, Manager, Watson House, Mr. F. Bell, Distribution Engineer, Southern Gas Board, Mr. L. J. Clark, B.E.M., Development Engineer, North Thames Gas Board, Mr. R. F. Hayman, Industrial Gas Officer, Gas Council, and Mr. J. D. C. Woodall, Sales Manager, South Eastern Gas Board.

A fault was that while questions put by the members were provocative, they failed to put the panel on the spot. One question, for example, was: 'On the assumption that there will be a national grid in one form or another within the next few years, does the Brains Trust consider it to be a practical proposition to lay a main across the Channel to France, and if so, what advantages could be gained from such a link?' Aimed at Mr. Bell, the question had interesting possibilities, which were in fact fulfilled. But far more to the point would have been a request to him for some detailed views on 'the assumption that there will be a national grid.' Mr. Clark also answered the question, and both engineers believe that the pipe-line could be laid (after all, oil lines were put down during the war). A considerable amount of experience has been gained since the war, especially in America, where underwater crossings have reached up to 20 miles. Techniques have been developed to counter many difficulties. The main snags, of course, are difficult contours, and abrasive sand movement. But Mr. Clark at any rate thinks that the English Channel would not provide these particular difficulties to any impossible extent. As to the need for such a pipe-line, that depends on how much of the indigenous natural gas France needs herself. But, both Mr. Bell and Mr. Clark think that if natural gas can be either piped across the Mediterranean from the Sahara, or shipped to France, then there is a good chance of getting it here at a price 'not much higher than the present cost of production.'

A question over which the panel took a little time to reach unanimity was whether the gas industry shouldn't try to get rid of coke. Mr. Woodall resented the question at first, for to him it was an implied running-down of the fuel, when the revenue from it was very badly needed. 'I regard the Clean Air Act as God's gift to the industry. We must push coke in place of coal.' Mr. Andrew, on the other hand, was equally final: In his view the question should have been worded: 'How long will it take to get rid of coke?' And the cold realism of Mr. Hayman: 'This is a one-fuel industry in theory and a two-fuel industry in practice.' Finally, of course, all these contentions were wrapped up in one murmur of agreement at Mr. Clark's mild reminder that the changeover, however inevitable, must be very, very slow, simply because rapid change of the pattern of production would mean an impossibly high capital cost.

A very much more difficult test for the Brains was what particular development in his own field each of them thought would improve the competitive position of gas during the next 25 years. Mr. Bell was obviously able to give an easy answer: To complete integration first within boards, and then between boards. Mr. Woodall's suggestion (which Mr. Andrew said would need the 'dearest flue in the world') was to develop a really satisfactory appliance that would provide both space heating and water heating in the home. 'I am not satisfied that anything we have got at the moment is really satisfactory.'

Everyone, of course, agreed that the price of gas had to be reduced. But how? Surely all the developments and efforts to improve efficiency, both technical and commercial, are in fact keeping the price down to a remarkably low level, compared with the increases in costs. However much one would like to make dramatic reductions, it cannot be denied that the labour force is constantly being pared down by changing methods while at the same time the product is being improved. As Mr. Clark said, the price of gas to the consumer is about twice that of gas into holder. But then getting the gas into the holder is only half the battle.

Personal notes

SIR HAROLD SMITH, Chairman of the Gas Council, was one of the nine honorary graduates who received degrees recently at Leeds. The honorary degree of Doctor of Laws was conferred on Sir Harold by the Princess Royal, Chancellor of Leeds University. Sir Harold, who was presented by Professor A. L. Roberts, said it was most important to strengthen the co-operation between industry and the universities, at several of which the Gas Council had established scholarships.

SIR JOHN STEPHENSON was guest of honour at an Eastern Gas Consultative Council luncheon in London recently, held to mark his retirement from the chairmanship of the Eastern Gas Board.

MR. W. K. MOORE has been appointed Manager of the Gas Cleaning Division of Steels Engineering Installations Ltd., Sunderland. This division is newly-formed to manufacture SPA dust collecting equipment, for which Steels hold an exclusive licence in the U.K. Mr. Moore will be responsible for the design and production of the SPA equipment, and installations incorporating SPA.

MR. B. DUNSTAN has joined the sales division of R. E. Roberts & Son Ltd., lead sheet and pipe manufacturers, of Bolton, and will represent the company in the North West, North Wales and West Midlands areas. For the past seven years, Mr. Dunstan had been employed by Begwaco Meters Ltd. as representative for the North Eastern, East Midlands, and West Midlands Gas Board areas.

MR. J. E. C. BAILEY, C.B.E., Chairman and Managing Director of Baird & Tatlock (London) Ltd., and Hopkin and Williams Ltd., left the United Kingdom last month for Canada and the U.S.A. While in America, Mr. Bailey will address the Scientific Apparatus Makers of America at their annual conference at White Sulphur Springs, West Virginia. He will speak on the European common market, and how it will affect exports from non-member nations, including the United States.

Diary

May 28.—NORTH THAMES G.C.C.: City Hall, Westminster.

June 1.—WEST MIDLANDS G.C.C.: Gas Offices, Edmund Street, Birmingham 3. Council Meeting at 2.30 p.m.

June 2.—WOMEN'S GAS FEDERATION: Church House, Westminster. Annual General Meeting. 2.30 p.m.

June 2.—SOUTH EASTERN G.C.C.: Clarendon Hotel, Gravesend. Council Meeting at 11.45 a.m.

June 3.—SOUTHERN G.C.C.: Town Hall, Bournemouth. Council meeting at 11 a.m.

June 6.—EASTERN JUNIORS: Cromer. Annual general meeting.

NEWBURY TO HAVE SOUTHAMPTON GAS

NEWBURY gasworks, says the Southern Gas Board, is to close in July. This is as a result of modernisation and development of the area grid system. With this news come more details of the progress of Southern Gas Board's main laying in Berkshire and Hampshire.

Extension of the 16 in. steel backbone main northwards towards Ipsden is proceeding satisfactorily and the section to a point just north of Brimpton is now nearing completion.

The 8 in. steel main from Brimpton to Newbury is complete, so within the coming month the test on the 16 in. main to Brimpton and its connection into Newbury will be made and the system passed through to the Newbury holder station.

The completion of this section of the work will mean the backbone main, fed with its gas from Southampton, and which is already connected to Whitchurch and Overton, will be able to supply Kingsclere, which it passes en route, and Newbury. This scheme will permit the extension of the distribution system from Southampton.

New DRUgasar agents

McLusky & Blincoe, Bardon Chambers, Infirmary Street, Leeds 1, have been appointed agents to F. A. Borchardt Ltd., for the North Eastern Gas Board area, the Sheffield and Rotherham Division and the northern part of the Lincolnshire Division of the East Midlands Gas Board, for the sale of DRUgasar balanced flue heaters and the Arnhem freestanding closed heating stove.

EIGHT CHAIRMEN IN ANNIVERSARY SUPPLEMENT

EIGHT gas board chairmen contributed to a supplement in a recent issue of the *Birmingham Post*, produced to mark the tenth anniversary of nationalisation.

The six-page supplement, including a full page of pictures, featured articles by Sir Harold Smith, K.B.E., Chairman of the Gas Council; Mr. Michael Milne-Watson, C.B.E. (N.T.G.B.); Mr. E. Crowther, C.B.E. (N.G.B.); Mr. T. Mervyn Jones (W.G.B.); Mr. R. S. Johnson, M.B.E. (E.M.G.B.); Mr. G. le B. Diamond, C.B.E. (W.M.G.B); Mr. C. H. Chester, C.B.E. (S.W.G.B.); Mr. W. K. Hutchison, C.B.E. (S.E.G.B.); Mr. C. H. Leach (S.G.B.).

Mr. Herman Roberts, industrial correspondent of the *Birmingham Post*, Mr. W. T. Bird, M.B.E., Distribution Engineer, Wales Gas Board, wrote for the supplement, as did Ald. John Lewis, O.B.E., Lord Mayor-elect of Birmingham and Chairman of the West Midlands Gas Consultative Council, Mr. A. Allen, Warwickshire Divisional General Manager, and Mr. A. V. Horsfall, Sales and Service Manager, West Midlands Gas Board.

The Gas Council was represented by Dr. F. J. Dent, O.B.E., Director of the Midlands Research Station.

A Newcastle newspaper, *The Journal*, also ran an anniversary supplement.

LONDON JUNIORS SECRETARY RESIGNS TO TAKE UP B.J.G.A. COUNCIL OFFICE

AFTER six years as honorary secretary of the London and Southern Junior Gas Association, Mr. J. D. Grant, of the North Thames Gas Board, has had to retire in order to take up the Chairmanship of the British Junior Gas Association Joint Council.

Valuable services

President of the London Juniors, Mr. C. H. Purkis announcing this at the 57th annual general meeting, spoke of the valuable services Mr. Grant had rendered to the members. A testimonial of ten guineas was voted to Mr. Grant.

The President also announced that Sir Henry Jones, Deputy Chairman of the Gas Council, and Mr. J. H. Dyde, Chairman of the Eastern Gas Board, had both conferred their patronage on the Association.

Officers for the session 1959-60 were elected as follows: President, Mr. R. K. Harrison; Senior Vice-President, Mr. P. J. Savage; Junior Vice-President, Mr. C. H. Townsend; Hon. Secretary, Mr. G. W. Heeley; Hon. Assistant Secretary, Mr. C. P. Henshilwood; Hon. Transactions Secretary, Mr. J. E. Mills; Hon. Treasurer and Hon. Assistant Treasurer, Mr. D. G. Winslow and Mr. T. J. Basford.

The Milbourne Prize for 1958-59, it was announced, had been awarded to Mr. H. J. Summerhayes for his paper entitled 'Gas in Tall Blocks of Flats.' The S.B.G.I. silver medal had been awarded to Mr. G. E. Johnson and Mr. J. A. Bradley for their paper entitled 'The Ignition of Town Gas.' And Mr. R. E. Clifford had won the President's Prize for his paper 'The Adaptation of a Fairweather Calorimeter for Use on Refinery Gas.'

Streamline

Streamlining the business session allowed President Mr. Purkis to present a distinguished panel to answer pre-submitted questions. (See Editorial Comment—'A Trust of Brains'—on opposite page.)

SCOTTISH GAS BOARD STAFF CONFERENCE

THE FUTURE OF GAS RESEARCH

Sir Harold Smith on the more rapid development of processes

HOW the future research of the gas industry may be carried out was revealed at the Scottish Gas Board staff conference at Peebles last week by Sir Harold Smith, Chairman of the Gas Council.

During the last ten years, he said, they had been prosecuting research quite vigorously, but until recently they had not really made the proper arrangements for developing laboratory research. 'We perhaps have asked too much of our research workers,' he added. 'It is no good thinking that the high-power research worker can invent his processes and at the same time develop them. We have got to the stage now in our research work where we realise that we have got to do something to enable us to develop these processes more rapidly and efficiently.

Six agreements

'A year ago we had an official opening of our research station at Solihull and a number of people saw what we were doing for the first time. As a result we have made agreements with six contracting firms to supply them with all the information we get as a result of our research work.

'We have not quite tied up our arrangements for development, but it looks very much as though we shall have under the Gas Council a small panel of engineers who will be in constant consultation with a Director of Research at Solihull and with him from time to time are likely to recommend what processes are worth developing to a more advanced stage. The six firms are also in consultation with us and they will probably have their own panel. When our panel decide that a certain process is worth bringing to a further stage they will consult with the contractors' panel and between them agree on what is the best and most efficient way of reaching a pilot plan.'

New gas industry

Sir Harold opened his address with a hint of the 'picture of the new gas industry which we are all seeing is beginning to emerge.' Out of the 1,000 separate gas undertakings taken over ten years ago 500 had been shut down; production had been increased to about 20% over that time, with a labour force reduced by 10%, with considerable savings and benefits to consumers.

'But during the last year or two the picture has begun to look a little bit grim and we are faced with, at the very best, a standstill over perhaps the next five years. But we have been working hard in many directions and today I think we can be justly proud—not complacent, by any manner of means. We can see now several ways of making gas which did not exist ten years ago and we are going to make the best use of these ways that are available to us.

'One object we have all got in mind the whole time is how we are going to give the very best service at the lowest possible price, for today it is really a question of price,' said Sir Harold.

'Just think of the picture over the next ten or 15 years. I think there is no doubt that you are going to see gas made in large gasification plants situated on the coalfields and at oil refineries—gas being made at a pressure of about 400 lb. per sq. in., practically free from sulphur and carbon monoxide and being discharged into a national gas grid, that grid also taking surplus gas from coke ovens, gas made from oil refineries, methane drained from mines, and possibly liquid petroleum gas which may be imported in bulk. It looks extremely likely that we shall be able to import and put into these mains liquid natural gas. Coupled with all these will be the small quantities of natural gas we find in this country, and we do hope that we will find sufficient underground storage to reduce the cost of distributing gas considerably.'

Sir Harold said that all the area boards realised there had to be a national gas grid. 'We have got to have nationally-planned production of gas in order to keep the cost down and make it competitive.'

Admiral Sir Denis Boyd, K.C.B., C.B.E., D.S.C., addressed the conference with 'Discipline' as his subject.

Financial, technical and commercial prospects in the Scottish area

THE main technical offering at the Peebles conference was a massive symposium on 'Retrospect and Prospect,' the joint work of three of the principal officers of the Board—Mr. A. F. Pollock, Chief Financial Officer; Mr. T. S. Ricketts, Chief Engineer; and Mr. R. H. Bone, Commercial Manager. It was followed by a lively discussion.

Introducing the section on finance, Mr. Pollock said that while the industrial and commercial sales of gas gave grounds for reasonable optimism for the future, domestic sales, which had been the backbone of their business, were giving cause for serious concern. Falling sales of gas had a disastrous effect upon finances, and no matter how hard they tried to effect economies, no matter how successful they were in increasing efficiency and cutting costs by work study and other means, a material fall in sales could rob them very quickly of all the financial advantages they had gained. It then became impossible to balance accounts without resort to an increase in the price of gas, and this in turn made it more difficult to maintain the level of gas sales. The number of consumers who had applied for the two-part tariff was only between 35 and 40% of the number who would immediately benefit by the tariff. This suggested that the sales force were not making the most of the opportunities.

Owing to the low level of appliance sales they had not for some years been meeting the cost of selling from the uplift on appliances. The Board's view was that the ironmongery side of their business should be self-supporting, and they expected the price of appliances to cover the costs of fixing and selling.

The architects

Selling costs tended to remain static, or in times of fierce competition to rise, so that unless sales of appliances reached a certain level the uplift did not cover the selling costs. Since 1954-55 appliance sales had not reached that level and the Board had been involved in an annual loss on the appliance sales account, mainly because of credit restrictions. One sometimes wondered if those who sat in high places in the Government and civil services, realised that they themselves were to some extent the architects of the Board's deficiencies. Fortunately there were signs that appliance sales might this year reach a profitable level. The subject of coke was a controversial one. If they could sell non-toxic gas cheap enough to compete on price with solid fuel, he would go all the way with those who would gladly see the last of coke. But he could not see that happening, for at least a good many years ahead. Meantime there was a real demand for smokeless solid fuel which would meet the rather exacting demands of the domestic market. They could, he believed, make such a fuel if the Coal Board would sell them the right coals. But, of course, these were largely the

Dramatic conference moments. Left to right: Mr. T. S. Ricketts, Chief Engineer; Mr. D. D. Burns, Deputy Chairman, during his summing-up; Mr. R. H. Bone, Commercial Manager; Mr. C. S. Stackpole, Managing Director, A.G.A.; Mr. A. F. Pollock, Chief Financial Officer.

coals that the Coal Board wanted to sell themselves, and here they would meet a real and perfectly understandable difficulty. He wondered if the way out was to form a joint marketing organisation in which the Coal Board, in exchange for a guaranteed supply of the right coals, would share in the profits of the high quality solid smokeless fuels market. This seemed to be an opportunity for the kind of co-operation between the nationalised industries which they were constantly being urged to develop.

On expenditure, they had in certain directions already secured worthwhile economies, but it must be their constant endeavour to cut costs still further by seeing that they got the best value for money and effort expended.

Referring to the mounting burden of capital costs, he said that some of their expenditure was indeed an added burden, and he had in mind particularly expenditure on mains services and meters for new housing. Because of the larger share now being taken by electricity, even in those schemes where freedom of choice operated, the return did not really justify the capital outlay. But they could not withdraw from new housing and the best they could do was to intensify their sales efforts at all levels to secure as big a share of this business as possible.

Horrible feeling

There was an enormous expenditure of effort and money at top level directed towards improving their competitive position, to improvements in production and distribution techniques, in selling methods and publicity, in education and training. He had a horrible feeling that at the lower levels much of that effort was being cancelled out.

He heard constantly of salesmen and fitters whose knowledge of their jobs and whose approach and attitude to customers left a very great deal to be desired. There were examples where these shortcomings had lost business for the gas industry and handed it on a plate to their competitors. There was undoubtedly a tremendous job of education and training still to be done, not only by education and training staffs, but by all those who were in supervisory positions and able to influence the behaviour of the staffs under their control.

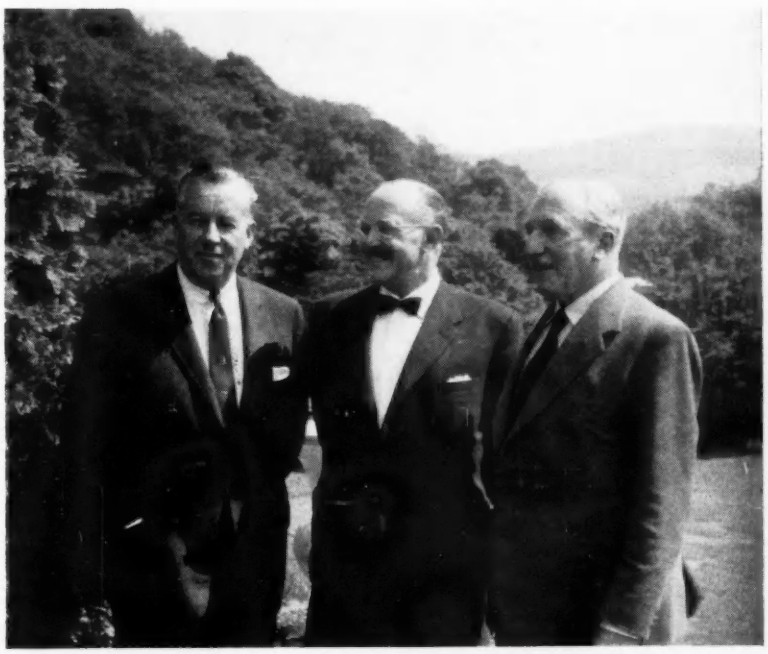
Introducing the technical aspect, Mr. Ricketts said that the programme of integration had already been extended far beyond the scope of the original proposals and grid mainlaying and consequent cessation of production at smaller works was ahead of schedule. As integration proceeded, and as gas production became progressively centralised in large production units, so it became more and more necessary to examine the economics of production. This in turn led to a search for a cheaper basic raw material than carbonisation coal for gas production.

As far as the future was concerned, it seemed reasonable to expect that new gas production plant installed in Scotland would be designed to produce gas by the high-pressure gasification of inferior non-caking coals. Supplies of suitable non-caking coals were available and should be exploited. The high-pressure complete gasification processes produced gas at a pressure and composition suitable for synthesis to liquid products. Much research was necessary to establish processes for the production of suitable end products, but this subject was of such vital economic and political importance that the time could not be long delayed when interest at national level in this matter was awakened.

The gas industry, by entering into the field of chemical and synthesis products, could widen its range of interests; the gas engineer, by virtue of his training, was competent to operate processes designed to produce gas for synthesis purposes and it might well be that the future processes would require the gas engineer to embrace the field of chemical engineering.

They were fortunate in Scotland in possessing at Cousland, near Musselburgh, the only source of natural gas so far exploited in Britain for town purposes. The exact capacity of the porous sandstone from which the supply was being taken was not known, but indications during recent months had given rise to some optimism that the ultimate capacity might exceed 2,000 mill. cu. ft.

The possession of underground storage facilities of such dimensions gave rise



At Peebles. Left to right: Mr. Chester S. Stackpole, Managing Director, American Gas Association; Mr. Sydney Smith, Chairman of the Scottish Gas Board; and Sir Harold Smith, Chairman of the Gas Council.

Mr. G. Keillor, Coatbridge and District, receives the Chairman's Cup for the best sales division.

to staggering possibilities. For instance, it would be possible to run all gas production plant in Glasgow and Edinburgh at a steady load factor without the need to put additional plant to work in the winter or stand off plant in summer. During the summer period the gas produced in excess of demand would be pumped into underground storage to meet the increased winter demand. On the assumption that underground gas storage of adequate capacity became possible, it could be calculated that on the basis of present-day gas demands it would be possible to reduce the capacity of gas-making plant in the Glasgow and Edinburgh areas from the present total of 120 mill. cu. ft. per day to 90 mill. cu. ft. per day.

In his introduction to 'The Commercial Aspect' Mr. Bone said that they had good reason to believe that they might expect some quite early and substantial increases in the industrial load. The long-term prospects of the industrial gas market in Scotland were undoubtedly very good. But the question as to whether, in the long run, they would sell more gas to industrial consumers than to domestic consumers was academic. Their objective for the immediate future must be to look for increased sales wherever they might be found. There were certain positive indications in the domestic market which gave the basis for a practical policy for increasing sales in this field.

The first and very obvious indication was that the removal of hire-purchase restrictions, and the strengthening of their selling organisation, the total value of domestic and commercial appliances sold during the year had increased by £876,349 over the previous year's total. If they could do this volume of additional business in a year in which they did not have the benefit of the relaxation of controls, and of much of their increased selling strength, until the last few months, it did not seem unrealistic to suppose that they could do considerably better in the current year and the immediate future. A further increase of this order in the current year would raise the total sales above the figure of £3 mill. which was the minimum required to enable the Board to meet selling costs.

The suggestion made was that the field of space-heating was one which in future might well provide the base load.

On a long-term view it might be that the main future trend in [illegible]he space-heating market would be tow[illegible]ds whole-house automatic warming.

Opening the discussion, **Mr. J. E. Wilkes,** Central Division, com[illegible]ented that all three authors had mention[illegible] the subject of coke and their hearers [illegible]were more or less led to the conclusion [illegible]that their future lay in gas and a super[illegible]or smokeless solid fuel. Whatever fe[illegible]ings they might have on a one-fuel in[illegible]ustry, he thought it was going to be a [illegible]ong time before they reached that st[illegible]ge. The immediate problem was that [illegible]hey were faced with a stock of coke, [illegible]and Mr. Pollock had mentioned that the problem was one of 150,000 tons. He was quite sure that if they concentrated on this aspect of sales on the domestic market they could make a real attack on the problem.

If they were going to do this they would have to get some control of their coke quality.

Mr. A. Higgs, Area Industrial Gas Officer, recalled that additional industrial sales to the value of £1½ mill. were referred to by Mr. H. R. Hart some months ago as the target aimed at by the Board. If they assumed that this gas would yield an average price of 15d. per therm, then £1½ mill. worth of gas represented a further 24 mill. therms, or approximately 5,280 mill. cu.ft. of gas per annum. Considered in relation to present output, it represented an increase in industrial sales on the 1957-58 figures of 58%. That was a very substantial increase in sales for a period of two to four years.

Mr. A. McFadyen, Glasgow and Western Division, remarked that nowadays everyone was talking about selling, and that was a good thing, but it should always be remembered that profits would be made in the retort house. It was vital that they should get into new housing, and they now had a selling force able to go round these houses and increase sales. The Board, however, had a long way to go before they could correct a certain attitude of mind. The field salesmen, however, were succeeding in selling, and showroom sales were also increasing.

Mr. D. F. Moore, Commercial Gas Sales Officer, Glasgow and Western Division, said that the central heating target set by Mr. Bone was attainable. But he would make a particular plea on behalf of non-profit-making organisations, such as churches and others, who were burning gas for central heating purposes at off-peak periods—Sundays and the evenings.

Mr. J. R. A. Clark, Assistant Sales Manager, Headquarters, pointed out that fewer than a third of consumers ever entered a showroom, but there was a wonderful opportunity of selling appliances in one's own home. He suggested that employees who burned a considerable amount of gas might obtain a discount, which would encourage them to get more appliances and make their houses real showrooms.

Mr. K. B. Triggs, Headquarters, agreed that many wives could qualify for prospect cards by introducing friends to appliances and that all Board employees should make the maximum use of gas-consuming appliances.

Continued on p. 359

Fireworks from A.G.A. chief

IT was down on the programme as 'Address on Commercial Policy of the Gas Industry in America.' But what Mr. Chester S. Stackpole, Managing Director of the American Gas Association, gave the conference was something very different. It was a brilliant and dazzling display of verbal pyrotechnics—not 'full of strange oaths' but crammed with anecdotal exuberances and eloquent pantomine. It wasn't just an address; it was a performance.

For those who wanted it, there was information in plenty on the commercial policy of the gas industry in America. But most were content to sit back and let the flowing eloquence of Mr. Stackpole engulf them. His closing words were delivered with all the fervour of a revivalist meeting. 'The gas industry,' he said, needs aggressive action. It needs noncomformists, non-orthodox people, with new ideas, new departures and new enthusiasms. It needs men who will tend to risk and adventure much, as in the Lurgi experiment. It needs men who are not ultra-conservative, who do not object too much, who do not consult too much. It needs men who can emphasise the prestige of the gas business and its importance to the community's welfare, and men who will help the industry's people grow in stature with effective development programmes, who will sponsor interchange of ideas of management with people having similar responsibilities in other companies. . . Do not pray for easy lives. Pray to be stronger men and women. Do not pray for tasks equal to your powers. Pray for powers equal to your tasks.'

A discussion followed the address.

I.G.E. President recommends joint meetings

Vital need to encourage junior associations

JOINT meetings of senior sections and junior associations were suggested by Mr. E. M. Edwards, President of the Institution of Gas Engineers, at the Spring lunch and meeting of the London and Southern Section last week.

Proposing the toast of the Section, he said that the keenness of the young engineer or technician was very evident, and it was vital that every encouragement should be given to members of junior associations.

Mr. Edwards also recommended that greater attention should be paid to the training of utilisation engineers than in the past, on the grounds that gas as a fuel was now in a much more advantageous position than it had been for a long time. In the Institution's education scheme, facilities were provided for men who would specialise in utilisation.

(Mr. Edwards' views on this subject are detailed in his presidential address to the I.G.E., published on p. 350.)

Opening his speech, Mr. Edwards said: 'This is the last district section meeting I will have the pleasure of attending during my year of office.

'To a President of the Institution are given many privileges, but none is greater than having the opportunity of visiting all the district sections, the affiliated associations, and the junior gas associations. To me it has been a most heartening experience to realise how strong the sections are.'

Each district section had its own problems and its own traditions, he went on. But where the boundary of a board also marked the precise area covered by a section, there was a danger of isolation. 'It may be that the section is drawn from the areas of more than one board—as this one is—and that I think is all to the good.'

Mr. J. C. Hogg, Chairman, replying to Mr. Edwards, assured him that the committee would give careful thought to the question of joint meetings with the junior association.

Mr. R. F. Robinson, Vice-President, welcomed the guests, who included Mr. E. J. C. Dixon, Controller of Gas Standards, Ministry of Power, Sir Henry Jones, Deputy Chairman of the Gas Council, Mr. Wilfred Bailey, Secretary of the Gas Council, Dr. W. T. K. Braunholtz, O.B.E., Secretary of the I.G.E., and Mr. A. G. Higgins, Assistant Secretary. Also present were Mr. J. H. Dyde, Chairman of the Eastern Gas Board, Mr. C. H. Leach, Chairman of the Southern Gas Board, and Mr. R. N. B. D. Bruce, O.B.E., Deputy Chairman of the North Thames Gas Board.

Mr. Dixon replied to the toast.

The Chairman later read his address, entitled 'Measurement for Control,' an abstract of which will be published in a later issue.

Mr. E. M. Edwards, President of the Institution of Gas Engineers and Deputy Chairman of the Wales Gas Board, accompanied members of the Yorkshire Junior Gas Association when they visited the Stanton Ironworks Co., Ltd., Nottingham, recently. Photograph shows, left to right, Mr. N. H. F. Haddelsey, Mr. R. E. White, President of the Association, Mr. E. M. Edwards and Mr. R. Neumann, Manager, coke ovens, at the Stanton coke oven plant.

LIGHTING ENGINEERS ANNUAL CONFERENCE

THE annual conference of the Association of Public Lighting Engineers is to be held this year at Aberdeen in September, under the Presidency of Mr. Ronald Parker, Superintendent of Lighting in Aberdeen.

The Lord Provost of the city will open the conference. This will be followed by the induction of Mr. Ronald Parker as President for the ensuing year. An interesting feature will be an address titled 'Fifty Years of Lighting,' by Mr. C. C. Smith, President of the Illuminating Engineering Society, being given in connection with the jubilee celebrations being held by the I.S.E. this year. Mr. Smith is the city lighting engineer for Liverpool.

Delegates may inspect an exhibition of street lighting apparatus and equipment and an outdoor display of lamp columns and mobile equipment on a site near to the conference hall.

Humphreys & Glasgow have ninth gas plant order from Japan

ANOTHER contract for gas plant has been placed by Japan with Humphreys & Glasgow, Ltd.

The order covers the installation of two units of carburetted water gas plant to be erected at Kanazawa. The contract, which has been placed by the Okura Trading Co. Ltd., for the Kanazawa Gas Co., also covers a waste heat boiler and ancillary equipment.

Work is due to commence almost immediately, and on completion the plant will be capable of producing 400,000 cu.ft. of town gas per day from each of the two units.

The Kanazawa plant will be manufactured and erected entirely in Japan by Humphreys & Glasgow's licensees, Ishii Ironworks, Ltd., to drawings supplied by Humphreys & Glasgow.

Although the contract is small—valued at about £25,000—it is important locally. Kanazawa, an old feudal capital, is the centre of a silk-weaving industry, and has a population in excess of a quarter of a million. It is one of the chief cities on the western side of Honshu, and is on the main coastal railway, some 150 miles from Osaka.

Kanazawa is the third Japanese contract to be awarded to Humphreys & Glasgow in recent months (the ninth in all). In the autumn of last year, they were awarded a contract to engineer and build a plant at Yaizu to produce town gas from heavy fuel oil by the Onia-Gegi process—the first of its kind in Japan, and in March this year a further contract was awarded to them for a similar plant at Himeji—each to produce 500,000 cu.ft. of gas per day.

The news item entitled 'Onia-Gegi Process Plant for Japan' which appeared in last week's issue on p. 321 stated that construction of a second unit at Yaizu would begin in 1960. In fact this unit is still at the planning stage and no contract has yet been placed. The first unit will be constructed in Japan by the Humphreys & Glasgow Ltd. licensees, Ishii Ironworks Ltd. The second paragraph of our earlier story was inaccurate.

AGREEMENT FOR JOINT DESIGN

SIMON-CARVES Ltd., Stockport, and Bruce Peebles & Co., Ltd., Edinburgh, have signed an agreement for the joint design and supply of electronic-pneumatic and electronic-hydraulic control and interlocking equipment for mine car handling and skip winding plant.

Presented to the 96th Annual General Meeting of the Institution of Gas Engineers, Llandudno, May 2

The President's Address

By E. M. EDWARDS, M.I.Mech.E., M.Inst.Gas E.,

DEPUTY CHAIRMAN, WALES GAS BOARD.

A YEAR ago, the Institution honoured me, and incidentally the Principality, by electing me as its President. This 96th annual general meeting is the second to be held in Wales, the earlier occasion being at Cardiff, in 1928. Since that time, the gas industry in Wales has greatly expanded, the number of consumers having increased from 316,117 to 483,051, and the annual gas sales from 31.3 mill. therms to 91.9 mill. therms—a threefold increase in 30 years. My opinion is that considerable further expansion will take place.

The technical, commercial and financial features of the developments in Wales have been described elsewhere, and I do not propose to elaborate upon them; but the influence of soundly designed gas grids is making available over a wide area ample supplies of gas, of constant composition and at economic prices, cannot be over-emphasised.

The Institution

The reports of the Chairmen's Technical Committee and of the Gas Education Committee, presented in 1958 at the 24th Autumn Research Meeting, and the 96th annual report of the Council, record the major activities of the Institution, and repetition is unnecessary. The strength and success of any organisation is materially dependent upon the vitality of its members and upon the support it receives from others in association with it. The Institution is extremely fortunate in having the full co-operation of the Gas Council, the area gas boards, member firms of the Society of British Gas Industries, various organisations, kindred associations, numerous individuals, and of its own members. The Institution's committees have become of increasing importance in the development of the Institution and of the industry, and we are admirably served by those who freely give of their time and knowledge in the work of the Council or Committees, and in other directions. I am glad to have this opportunity of expressing my gratitude to all who have supported the Institution throughout a very active year.

The district sections and affiliated associations play a major rôle in our affairs, and it has been my privilege and pleasure during the year to have attended many of their meetings. I have been greatly impressed by the standards of the papers presented, by the high level of discussion, and by the readiness of members to interchange experience and knowledge. I have been equally stimulated by their enthusiasm and good fellowship. My attendances at meetings of junior gas associations also have given me much pleasure, where the same characteristics are so evident.

It is particularly important that full support be given to the district sections and affiliated associations. It is at least as important to give every encouragement to the junior gas associations, for upon their members will fall the responsibility of giving effect to many of the new techniques. Some of the senior associations periodically arrange joint meetings with junior associations. This practice is to be commended.

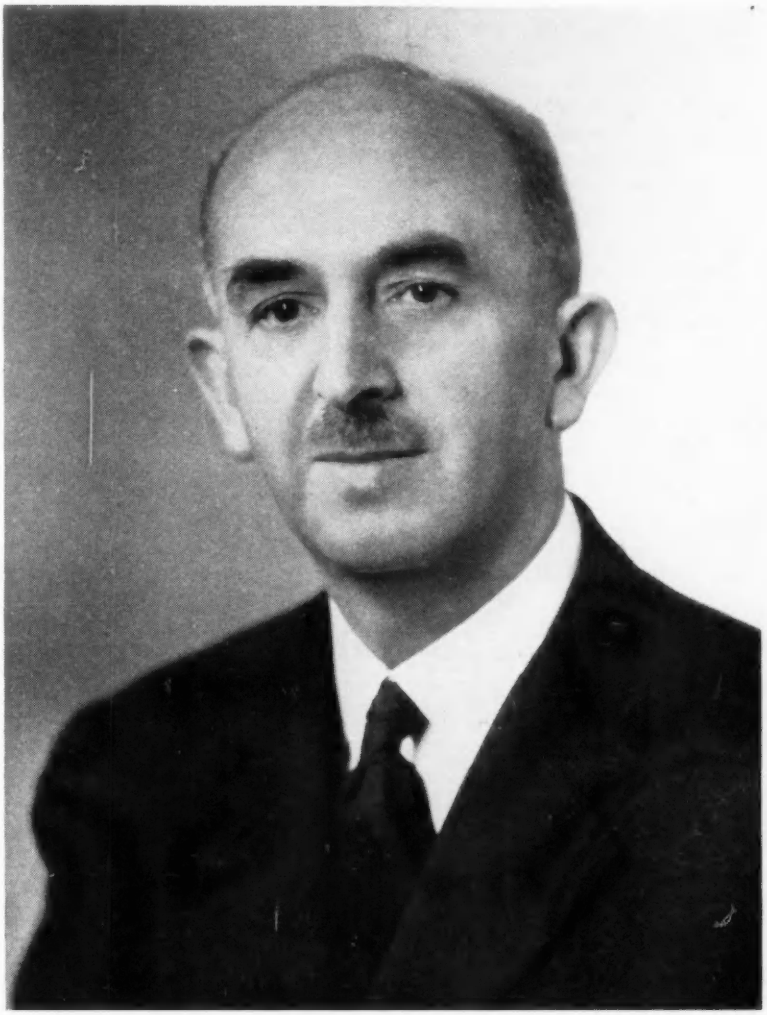
Developments that concern one profession are often of great interest to, and may be of consequence to, members of other professions. The Institution participates annually in a meeting with the Coke Oven Managers' Association. It is a member of the Engineering Institutions' Examination Standing Committee, and has a strong affiliation with the Institution of Civil Engineers on education. Certain district sections participate in joint meetings with organisations having kindred interests, such as the Coke Oven Managers' Association, and the Institute of Fuel. This practice should be extended.

The total membership of the Institution at 3,469 shows a healthy progression. Many of the 1,608 associate members are eligible for transference to full membership, but they may have overlooked the fact. It is in their professional interest and in the interest of the Institution that they make application for transference to full membership.

International Gas Union

The Institution has fully participated in the work of the International Gas Union, which is of increasing value and importance. A report of the 7th conference, held in Rome, in 1958, is given in the 96th annual report.

At the 96th annual meeting, a special meeting of corporate members will be held to consider and, if thought fit, approve amendments to the Institution's Royal Charter and by-laws. Detailed information of the proposals will be submitted to the corporate members by the Secretary. Your Council has given close consideration to, and commends to you, the proposals that take account of the changing requirements of the gas industry. The proposed revision of the associate membership examination, and of the conditions and classes of membership, would bring the Institution more closely into line with the other Engineering Institutions, and would better provide for the training of the highly-qualified



MR. E. M. EDWARDS

technical specialists that present and contemplated developments demand.

The Young Engineer

Fundamental changes of technique now being developed in the gas industry place upon the more senior engineers an especial responsibility to ensure that the younger engineers are properly trained and equipped to deal with the tasks and problems they will have to face. The Institution, and the area gas boards, through their training and education schemes, will provide guidance in technical studies; while area gas boards, through their engineers, will ensure a full practical training. But technical training in itself is not sufficient. A man must develop capacities of leadership if he is to make full use of his technical training and knowledge. An engineer should develop the practice of sensible delegation, remembering always that the ultimate responsibility remains his. Full and purposeful delegation demands confidence in the ability of others; it demands of oneself leadership and understanding, such as will create in others a deep-rooted respect—a respect conditioned out of an acknowledgment of competence and character, influenced by the knowledge that if at any time it is necessary to seek advice, it will readily be given. Personal decisiveness in young engineers should be encouraged, and an attitude of mind inculcated that thought alone is not enough; but that, to be effective, thought must be translated into action, and decisions made with courage and promptitude.

There is a danger in the larger organisations that size may lead to remoteness and inflexibility. Against these one must safeguard, remembering that a successful enterprise is composed of a number of individuals, all working as a team with a common purpose. As he advances in the profession, the young engineer will attend meetings of technical committees. He should remember that successful committee work demands self-discipline. Irrelevancies must be avoided; thoughts must be properly marshalled and presented; there must be strict adherence to the point under discussion; and the business of the committee should be conducted without waste of time. An engineer should accept his authority and carry his responsibility, mindful that, although full and trusting co-operation with others is to be encouraged, unnecessary consultation and discussion should be

avoided. The young engineer should be conscious always of the fact that the well-being and advancement of the industry is materially dependent upon the manner in which he handles and controls the human and material resources made available to him, and that of these the former are of the greater importance.

Communications

An important feature of the Institution's activities is the readiness with which its members, the Gas Council and representatives of kindred institutions and organisations provide valuable papers at the annual general meetings and at the autumn research meetings. The preparation of such papers involves much thought by the authors, and often a material sacrifice of their leisure time. The speed of current developments has naturally increased the numbers of communications. Papers presented to the Institution should not normally exceed the 10,000 words advised, because the cost of printing is extremely high, and the submission of a paper of undue length may result in the reader having available insufficient time to give to the subject the attention its importance warrants. The author's introduction or verbal presentation should be brief and clear, so as to afford the maximum time for discussion, because it is upon the 'cut and thrust' of debate that much of the success of a meeting depends.

Speakers to the discussion have an especial duty to make their contributions concise and interesting. The time available to individual speakers will be influenced by the number of intending contributors to the particular discussion. If a speaker takes up too much time, the chairman may have to refuse the floor to other would-be speakers because of limitations of time. The problem is always a difficult one for the chairman of any meeting, but he would be aided greatly if speakers did not exceed the maximum of eight minutes prescribed in the Institution regulations for the conduct of meetings. We should all be sensible of the need for self-discipline. An increasing amount of the time of engineers is occupied in reading technical publications and reports. It is important that young engineers responsible for the preparation of reports recognise the need for economy in the use of words, without loss of clarity. Even the most junior engineer should be encouraged from the outset to put forward his own recommendations, where it is appropriate that he should do so. This will encourage him to develop a sense of personal responsibility; and if his recommendations are not accepted, the reasons should always be explained to him.

The Gas Industry and Energy Demands

Throughout the world, standards of living are rising, and demands for consumer goods are increasing, with advancing demands upon energy in one form or another. The world reserves of fossil fuels are not known with accuracy, as new discoveries are constantly being made. Dr. A. Parker, C.B.E., has indicated that available estimates show the probable and possible energy resources of the world in the form of the fossil fuels are equivalent to about 5 mill. tons of bituminous coal, and that of this quantity 93% occurs as coal and lignites and methane associated with the coal; 5% as petroleum and natural gas; 1% as oil in oil shale, and 1% as peat. Estimates for oil from tar sands are not included, as they are so indefinite.[1] Dr. Parker has also expressed the view that, with present techniques of mining, there is in Great Britain sufficient economically mineable coal for 200 years, at an average rate of production of 250 mill. tons per year. The total primary fuel consumption within the United Kingdom in 1956 was 253.7 mill. tons of coal equivalent, 214.5 mill. tons being coal, 38 mill. tons oil, and the small balance hydro-electricity.[2]

Various authorities have endeavoured to estimate the future national fuel demand, and such estimates for 1970 quota figures of from 275 to 342 mill. tons of coal equivalent, with subsequent considerable further increases. Great success has been attained in the discovery, throughout the world, of new oilfields, and, undoubtedly, further discoveries will be made. Nevertheless, the available information appears to indicate that it would be wise to anticipate that by the end of the present century the western world will be encountering difficulties in maintaining the expansion of oil supplies.[3]

Dr. D. T. A. Townend, C.B.E., has quoted published figures for the world reserve of coal and oil and for the rate of growth of consumption. He has drawn attention to the wide differences in energy consumption per head of population between the highly industrialised countries and those whose industries have yet to be developed, and he has predicted that, when industry becomes established in these latter countries, the use of oil may well be restricted by its decreasing availability, which may be felt by the year 2000.[4] Even the highest estimate of the resources of oil are much smaller than those of coal. A recent assessment of the availability of natural gas in the United States of America estimates that, between the years 1985 and 2000, supplementary supplies of gas will be needed to balance out declining natural gas availability, and that such synthetic natural gas supplies will be derived primarily from coal and oil shale.[5]

Dr. J. G. King, O.B.E., has mentioned that the development of nuclear energy for electricity production promises by 1975 to be 80 mill. tons (24,000 MW) of coal equivalent, when it may represent 80% of total electricity production.[6] Whether or not electricity produced from nuclear power stations will be substantially lower in total cost than that from conventional power stations operating on a large scale has yet to be proved, bearing in mind that capital costs of the former represent two-thirds of the total cost, and of the latter one-third. It may be that in time, although it is a long way in the future, the application of reactor heat to chemical processing, such as the splitting of water into its components of hydrogen and oxygen, will be of great interest to the gas industry, when temperatures near to or exceeding 1,000°C. have been reached.

It is against a broad background embracing the preceding that we have to consider the future of our industry. Evidently, for at least several decades, the use of various grades of oil, liquid methane, butane and propane, could constitute a very important part of our activities, but in the long run the full development of the industry must be based on coal. This is of vital importance to the coal industry, especially in view of the strong and increasing preference of domestic and other fuel users for a refined fuel that can be used at high efficiency in a clean and easily-controlled form. If

the solid-fuel requirements of the electricity industry decrease by reason of the use of nuclear power for electricity generation, and the coal industry continues to lose business to the oil industry, it becomes increasingly important to the coal industry to encourage to the full the development of the gas industry as the principal user of its product. It should be remembered that the oil industry is also a competitor of the gas industry, and it is better for the coal industry to sell coal to the gas industry for gasification, rather than possibly not sell it at all.

The gas industry is tending to use less coal, principally because of the disproportionately high advances that have taken place in the cost of carbonising coal, the present delivered price being about twice that prevailing in 1949. In any industry, especially where the cost of the raw material forms so important an element of the final cost of the commodity for sale, substantial increases in the cost of the original raw material will compel those responsible for that industry to seek alternatives. The strong trend of research and development of the gas industry in the conversion of coal into gaseous refined fuel is in the direction of the gasification of the small-sized lower-graded and lower-priced coals that are now, and are also likely in the future to be, in plentiful supply.

The gas industry, which is developing increasingly as a large-scale chemical industry, will be greatly interested in the findings of the committee recently set up by the Minister of Power to enquire into the possibilities of converting coal into chemicals, gas, and oil. The task of the new committee is to review the work done in recent years on the development of processes using coal as a raw material for the production of marketable products of a chemical, gaseous, or liquid hydrocarbon type, and to recommend the direction in which future research and development should proceed, and the type of organisation best suited to carry on such work.

The Changing Scene

The figures of sources of gas supply for the years ended March 31, 1957, and 1958, reveal salient features.

	Made in boards' own works				Bought from coke ovens (mill. therms)	Bought from oil refineries etc. (mill. therms)	Total from all sources (mill. therms)
	Coal gas (mill. therms)	Water gas (mill. therms)	Other gas incl. oil gas (mill. therms)	Total (mill. therms)			
1	2	3	4	5	6	7	8
1958 ..	1,967·3	387·5	42·3	2,397·1	480·3	20·2	2,897·6
1957 ..	2,070·4	278·0	34·0	2,382·4	456·7	9·7	2,848·8
Percentage of total							
1958 ..	67·9	13.3	1·5	82·7	16·6	0·7	100·0
1957 ..	72·7	9·7	1·2	83·6	16·0	0·4	100·0

In 1958, coal gas accounted for 67.9% of the total gas from all sources, required 26 mill. tons of coal, which resulted in the production of 10.2 mill. tons of coke for sale, and continued to be an important feature of the industry's activities. The previous year, 27.7 mill. tons of coal was used, and 11.3 mill. tons of coke was made available for sale. The reduction in the quantity of coal gas made, accompanied by increases in the availability of gas from each other source, is indicative of the trend. Currently, additional coke oven gas, refinery gas and methane from coal mines are being taken, a supply of natural gas is being utilised in Scotland, and more plants are gasifying larger quantities of a variety of liquid feedstock in various types of plant.

It is significant that two large new works have been built by the South Eastern and North Thames Gas Boards based solely on the gasification of refinery products. Supplies of refinery gas are also being taken by other boards. Undoubtedly, we shall see further collaboration between the oil industry and the gas industry, especially in the processing of refinery gas and the gasification of the oil industry's out-of-balance products. This could be an important ancillary to the gas industry's activities.

Important Venture

An outstanding development was the pioneering voyage of the Methane Pioneer, carrying the first cargo of liquid methane; from Venezuela to Canvey Island, for the North Thames Gas Board, which is carrying out this major and responsible practical experiment on behalf of the Gas Council. The technical problems involved in liquefying methane, conveying it as a liquid at a temperature of −258°F., across the Atlantic, storing, handling, and reforming, are many; the physical and chemical considerations for the safe and secure accomplishment of the project have called for a very high degree of engineering and technical skill and of courage; the conception of the scheme reveals great imagination; and, should further experience prove its technical and economic soundness, it will be to the great credit of those associated with this important venture.

The first underground storage of gas in Great Britain has been brought into operation by the Northern Gas Board. The Scottish and West Midlands Gas Boards are installing large Lurgi plants for the gasification of coal with oxygen and steam. The North Western Gas Board is, on behalf of the Gas Council, proceeding with the installation of a commercial-scale plant for the high-pressure hydrogenation initially of oil, and later of coal. The Gas Council's research programme, as revealed in various reports and at autumn research meetings of the Institution, demonstrates the intense activity that is taking place, especially to create new means of gas production and improvements in utilisation. High-pressure grid pipe-lines have been constructed, using highly mechanised pipe-lining techniques, and tested up to 500 lb. per sq. in. w.g.

Dr. J. Burns, G.M., in his outstanding presidential address, well outlined the general pattern of the future gasification processes, with long-distance high-pressure transmission. Undoubtedly, the type of development he portrayed will take place, although possibly the distribution pattern may be varied in the light of new developments such as the large new oil refinery and ocean terminal being constructed at Milford Haven. Although the use of coke oven gas has developed materially, there is a case for further examination, in some areas, into the greater use of coke oven gas, with advantage to the coking industry and to the gas industry. Of particular relevance is the development of slagging or other types of gas producers designed to use low-grade coal, and able to manufacture producer

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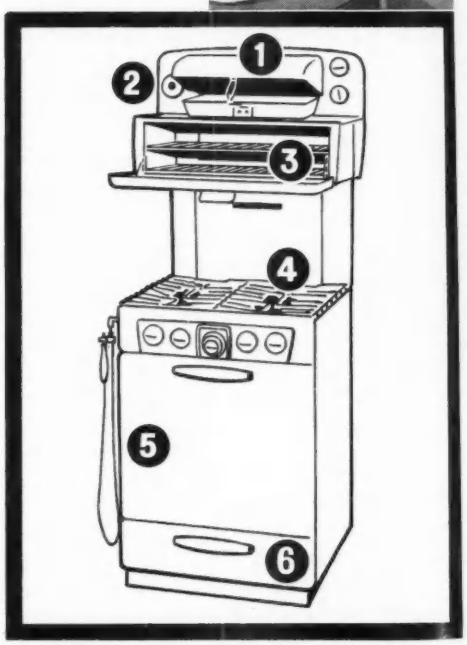

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gas at low cost, to release coke oven gas now utilised for heating coke ovens. In certain parts of the country, as in Wales, the collection and utilisation of methane from coal mines can be of signficance. Following experience with supplies from five coal mines in Wales, a scheme is under examination, with the South Western Division of the National Coal Board, for taking mine gas from 24 coal mines, the estimated daily yield of 500 B.t.u. per cu.ft. gas equivalent being about 15 mill. cu.ft.

The preceding observations demonstrate the visionary activities of those responsible for the future of the industry, in which the members of this Institution play a vital part. New problems arise and fresh situations and circumstances occur; we all need to prepare and adapt ourselves to meet them.

We must not, however, ignore the fact that there will be for many years to come a strong demand for gas coke as a clean, smokeless fuel. Although the production of gas coke for sale fell to about 9½ mill. tons in 1958-59, by reason of the high stocks in Western Europe, great attention is being paid to the preparation of this fuel for industrial, commercial, and domestic appliances, including open fires. New highly reactive cokes are being produced for use in old-fashioned grates, and cokes that conform to the new British Standard for domestic open-fire coke are being marketed.

I believe the future will largely be upon the lines of high-pressure gasification of coal and oil in a relatively small number of very large plants situated principally near the coalfields, oil refineries and major ports. The processes now being developed offer the promise of lower production costs of gas low in carbon monoxide. and sulphur; and the high pressures at which the gas will be produced will enable it to be transmitted economically upon a wide scale through a national or seminational gas grid. These and other developments will naturally take some time to accomplish, as also will the development of synthesis processes and potential chemical products. In the conditions of intense competition existing in the fuel market, the gas industry must actively pursue all means of increasing gas sales, and of reducing costs, consistent with maintaining a good service to consumers and fair treatment of employees.

Utilisation and Sales

During the past year, we have seen, for the first time in 20 years, all forms of fuel in plentiful supply, and all restrictions upon the use of fuel by consumers have been removed. Oil is readily available; the electricity industry has increased considerably its generating capacity; coal and coke stocks are high; and the gas industry is in a position to meet any demand made upon it for gas and coke. In July, 1958, household coal became free of restrictions. We have now entered an era, new to many of the younger generation engaged in the fuel industries, of free and keen competition for the fuel market.

The strong preference of consumers today is for fuels that are clean, convenient, efficient, easily controlled and labour-saving, requiring no storage on their premises. These trends are being accelerated by changes of social habits, greater demands for comfort and cleanliness in home and work surroundings, and by the increase in the purchasing power of consumers. Under the Clean Air Act, 1956, the controls relating to dark smoke, new installations, and grit and dust emissions, became applicable to industry in June, 1958, in England and Wales, and in January, 1959, in Scotland. At March 31, 1959, 184 smoke control areas or smokeless zones, covering 24,000 acres, were operating confirmed, or awaiting confirmation. The Beaver Committee's proposal was that within 10 to 15 years' time all the 'black' areas of the country could be made smokeless, and that this would require the creation of smoke control areas at an average rate of 500,000 acres a year. While the progress to date has been limited, there is no doubt that its speed will be accelerated.

The quantities of gas sold by the gas industry in this country in the years ended March 31, 1957, and 1958, were:—

	1957 (mill. therms)	1958 (mill. therms)
Domestic: Prepayment	834.9	823.8
Credit	493.7	502.5
Total ...	1,328.6	1,326.3
Industrial	749.6	788.7
Commercial	387.0	398.6
Public administration	42.4	42.5
Public lighting	38.5	34.6
Inter-board sales in bulk	—	0.1
Total gas sold	2,546.1	2,590.8

Since 1938, the annual sales of gas by the gas industry in Great Britain have advanced by 73.2%, and, although during the last few years the rate of increase has been relatively low, it must not be forgotten that the industry has held and has consolidated the very great increases that took place during and immediately following upon the second world war years; but there is no room for complacency. The greatest single need of the industry is to accelerate its rate of gas sales increases in all fields, especially in the domestic field. Changes in relative fuel costs, advances in gas appliance efficiency, and gas tariffs now available in most areas, have greatly improved the competitive position of gas in relation to solid fuel and to other fuels. This opens a much wider market, especially in relation to space heating and water heating. In order to develop these opportunities to the full, it is essential for the industry to train very much larger numbers of utilisation engineers for industrial, commercial, and domestic purposes. The proposed revisions of the Institution's education scheme provide for this important development. It is increasingly desirable for the industry's salesmen to acquire the Institution's certificate in gas salesmanship and consumer service.

The improvements in the efficiency of convector fires with controlled ventilation are spectacular. The equipment now available for selective warm air heaters, and small-bore central heating by gas is highly efficient. The introduction of the low-priced gas refrigerator has revealed the great demand. Gas for cooking is the consumers' established preference, and, additional to the great advances in design and efficiency that have already been achieved, we may expect to see a widespread use of automatic ignition; and there is a real possibility of thermostatic control on hotplate burners.

This form of control will probably also apply to instantaneous water heaters.

The new work on various types of shared flues has confirmed their practical advantages in multi-storey blocks of flats from the points of view of effectiveness, savings in capital cost, and savings in space. For catering, there have been substantial advances in speed and efficiency of a wide range of appliances, and the standards of finish have been greatly improved.

Thirty per cent. of the industry's sale of gas is to industrial users, who, conscious of the better product that derives from the use of gas, are rapidly taking advantage of the suitability and economy of our fuel, and of its effect in lowering unit cost and increasing factory production. The greater adoption of automatic process and product control, and the further development of recuperation, will accelerate this trend, supported as it is by the first-class advisory service provided to industrialists. A strengthening of the numbers of well-trained industrial gas engineers would undoubtedly result in yet more rapid expansion of the industrial load.

An examination of the load factors of undertakings' distribution systems and equipment can reveal striking figures. It is interesting to calculate the annual load factor of a large undertaking by relating the maximum half-hour's demand experienced to the quantity of gas the system could distribute at that rate throughout the year, although the system could meet a greater demand. Upon the basis of the maximum half-hour's demand experienced to date, the annual distribution load factor for one large undertaking supplying about 85,000 consumers is only 30%. The comparable figure for the electricity undertaking is 51%.

We have always claimed, and rightly so, that one of the great advantages of the gas industry is that it can store its main product, but electricity cannot be stored economically. Consequently, the electricity industry has had a great incentive to press for a high generation, distribution and utilisation load factor. Gasholder storage is an element in the total cost of gas,[7] and, although regard must be paid to daily, seasonal, and annual load factors, we should not permit the ease with which gas can be stored to minimise our endeavours to improve substantially the load factor upon distribution systems and equipment. Substantial quantities of additional gas could be distributed with a limited increase and, in some cases, no increase, in distribution costs, nor in certain overhead charges. Clearly, there is a need for every effort to be made to improve the annual load factor, thereby making greater use of the capital invested, with a consequential reduction in the costs/therm.

Capital Expenditure

Capital must earn its keep. It is salutary to remember that, dependent upon the interest rates and the period of amortisation specified, for each £1 borrowed approximately £2 has to be repaid. The timing of capital expenditure will be related to the need, and it can be influenced by the interest rates to be paid for the money borrowed. Engineers should, whenever possible, stage their projects so that the return will be in step with the economies to be derived or increased volumes of business to be served. Mistakes in capital projects, whether they are in respect of design, methods of construction, or of timing, can have far-reaching consequences. Engineers continuously seek to devise methods of minimising capital expenditure upon many diverse projects. An interesting example arises from the reconsideration of the design of low-pressure distribution systems.

If, for a typical local housing scheme, we take a design basis of 30 cu.ft. per hour per domestic consumer of gas for the moment of instantaneous demand, with 100 therms per consumer per year, this represents an annual load factor of only 7.6%. Changes in the relative costs of power, labour and materials now often make it more economical to design local distribution systems on the basis of providing off-peak requirements at low pressure and to boost up to 20 in. w.g. during periods of peak demand, fitting service governors at all meters. With such a system recently designed for a new housing estate of 2,700 premises, the saving on capital cost was about 25%, and on total operating costs 20%. The principle is also of value in increasing the effective capacity of distribution systems becoming overloaded but in good physical condition; for example, such a scheme recently completed showed that the cost of the conversion of the system to give 120% increase in capacity was only one-eighth of the cost of laying new mains to give equivalent capacity. Obviously, unnecessary capital could be expended in providing large low-pressure mains if their ultimate use is to be at medium pressures.

A large proportion of the existing capital assets of the gas industry, as with railways and water supply, was constructed when costs were very much lower than they are now. The present-day replacement costs may range from three to ten times the original cost, dependent upon the nature of the plant or equipment and the time when the original expenditure was incurred. Planned maintenance, to preserve the life of valuable assets, which with proper care are good for many years of further useful service, is, therefore, of great importance. The replacement of such items at present-day cost, unless accompanied by a very great increase in efficiency, and a substantial advance in gas sales, would increase gas costs. Obviously, particular attention should be given to items representing major investment, especially gasholders and distribution systems, having in mind that these continue to be required even when local gas production has ceased.

Efficiency and Cost

The record of the industry demonstrates the high level of efficiency of operations, and the continuous efforts made to effect additional improvements. The scope for further substantial improvements in the efficiency of processing the raw materials in the present types of carbonisation and gasification plants is relatively limited, although progress continues to be made. The new processes now being developed hold great promise, but it will be some years before they can provide a substantial part of the industry's total output. Quite rightly, a concentrated effort is being made to develop new production methods, because, as an examination of the published accounts of the industry will show, the net cost of making gas is the highest single item of expenditure per therm of gas sold.

The remaining expenditure, including capital charges,

material at 8.7d. per therm of gas sold, warrants the same critical examination as that given to production in our endeavours for greater efficiency and lower cost. A great deal of work is, of course, going on in this direction, including new methods of laying and maintaining mains and services and greater mechanisation of distribution operations; development of mains and service surveys; automatic control of holder stations; and improvements in the design of, and reduction in the power requirements of, compressors now used to an increasing extent.

Experience in other industries, and developing experience in the gas industry, has proved that the application of work study can achieve considerable savings in the cost of labour by better organisation of work, improved methods, and provision of incentives to greater output. The changes involved naturally need the most careful preparation by way of consultation and negotiations. The indications are that, although improved organisation and methods can achieve a great deal, and should be developed as far as possible before applying incentives, the best results are generally obtained by combination with incentives. The field of operations is wide and there is scope for its further application within the gas industry, preferably by men trained as gas engineers who have received the necessary additional specialist training.

The Engineer's Relationship with his Accountancy and Commercial Colleagues

The increasing complexity of modern industry, and the speed and nature of technical developments, demand close relationship between those responsible for technical, commercial and accountancy operations. In almost all operations affecting, first, capital expenditure, secondly, the best use of financial resources, and, thirdly, means of operating in the most efficient and economical manner, the activities of those responsible for the functions mentioned cannot be regarded in isolation; often one impinges upon, and affects, the other, and a proper degree of co-ordination is essential. The commercial officer's proposals for developing gas sales must take account of the engineer's views upon the means of making the gas available, and the accountant will be vitally concerned with the financial consequences. A clear understanding of the implications of the various functional investigations leads to a better common presentation of schemes, with co-ordinated recommendations.

In schemes involving capital expenditure, this applies to the initial project and estimates, to the effective control of construction, and to the assessment of final performance against the original estimates of capital expenditure and financial results. Close collaboration at the planning stage of new capital projects helps to establish a list of priorities when, sometimes, financial priorities conflict with technical needs. Engineers will need assistance in the interpretation of figures and of accounts, and they should increasingly make themselves familiar with the new techniques of management accounting. Accountants equally will need to acquire knowledge about the non-accounting functions, if they are to be able to present figures in an intelligible and helpful form, while commercial officers can receive guidance from their technical and accountancy colleagues on the implications of various forms of load development.

Full co-operation will lead to arrangements being made with the accountant to supply the engineer with the essential figures he needs. Approximate, but reasonably accurate, figures supplied promptly are far more useful than figures of greater accuracy supplied too late after the event, when effective action cannot be taken. Care has, of course, to be exercised to avoid the disease of 'paralysis by analysis.' In almost all aspects of operations, the sections form an integral part of the whole, and each can only play its full part if it has a reasonable understanding of the operations of each of the others.

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Go-devil Safety Practice

SAFETY precautions for workers who may be exposed to ionising radiations arising from the inclusion of radioactive markers in Go-devil devices for the detection of obstructions in pipe-lines are set out in a new booklet, *Radioactive markers in Go-devils; Safety Precautions*, recently published by the Ministry of Labour and National Service.

Go-devils consist of tightly fitted rubber washers, scraper vanes or wire brushes mounted on a central core. They are frequently used by the oil, gas, water and other industries for detecting whether newly laid mains are free from obstruction, and also in the routine maintenance of existing pipe-lines.

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The use of radioactive substances in these devices requires the observance of strict precautions to avoid hazards which arise, and a code of practice for persons engaged in such operations is set out in this publication. This new illustrated booklet is one of a series dealing with safety, health and welfare in industry being prepared by the Ministry of Labour and National Service designed to give guidance and information about the best practices to be followed.

SCOTTISH GAS BOARD CONFERENCE

Continued from p. 348

Mr. J. Dagnall, Central Division, remarked that it might be advantageous to accompany publicity for development with a reiteration of the guarantees to employees affected by technical changes. He felt that it should be stated that not everyone welcomed these technical changes and developments unreservedly, even if these were accepted intellectually as desirable and indicative of progress and greater success and security for the industry as a whole. If an employee was worried and concerned about how these changes affected himself and his family, his effective contribution and co-operation—so essential for the success of the schemes—were inevitably undermined. The papers presented at the conference had emphasised technical aspects—that was their object. He was afraid that the wrong impression might be left if nothing was said about the generous and substantial guarantees given to employees.

Mr. R. W. Deans, Glasgow and Western Division, referred to Mr. Higgs's remarks on the new industrial loads now being obtained. It had been found that the only limit placed upon their expansion was by the numbers of technical staff available.

Mr. J. A. Ferguson, Glasgow and Western Division, said that, while recognising the difficulties of capital expenditure, they should consider the possibilities of some acceleration of the programme of the development of the super grid. Tremendous financial savings could result from the use of the underground storage facilities of the natural gas wells.

Mr. B. Millan, Headquarters, warned against biassing tariffs against domestic consumption. They were losing domestic consumers, and the accelerated loss had coincided with the introduction of the last tariff. He thought they ought to have a survey of the consumers they had lost to see whether it was a general loss or whether it was because these consumers were particularly hard hit by the tariff.

Mr. R. S. Owen, Divisional Service and Sales Manager, Northern Division, said that he felt there was one very important omission in the examination of future efforts. Did they really know sufficient of the competitive position of their industry? He put forward a very strong plea for the use of market research as an integral part of their sales organisation.

The conference, the third of the series, was presided over by Mr. Sydney Smith, C.B.E., Chairman of the Scottish Gas Board, who opened the proceedings with a detailed report of the Board's activities. 'I am glad to say that the process of achieving the co-ordination of all functional activities is proceeding within a soundly-established administrative structure.'

Mr. Smith added that the past year had seen no big development affecting the whole area; it had, in fact, been a period of consolidation; but there had been many interesting and worthwhile developments which no doubt would make their influence felt as time went on.

'I have in mind, among many other developments, the setting-up of work study sections; the introduction, on a trial basis, of an incentive scheme for salesmen; incentive schemes for meter readers and collectors, for mainlaying personnel and so on. All are designed towards greater operational efficiency, better service, and increased administrative economies, with some material benefits for those on the job.'

At the close of the conference Mr. Smith presented the Chairman's Cup to the Coatbridge and Airdrie unit as winners of the Sales League. The trophy was accepted by Mr. G. Keillor.

Following a summing-up of the conference by Mr. D. D. Burns, Deputy Chairman of the Board, a vote of thanks to the Chairman and those who had contributed to the proceedings was proposed by Mr. D. Beavis, General Manager of the Edinburgh and South-Eastern Division.

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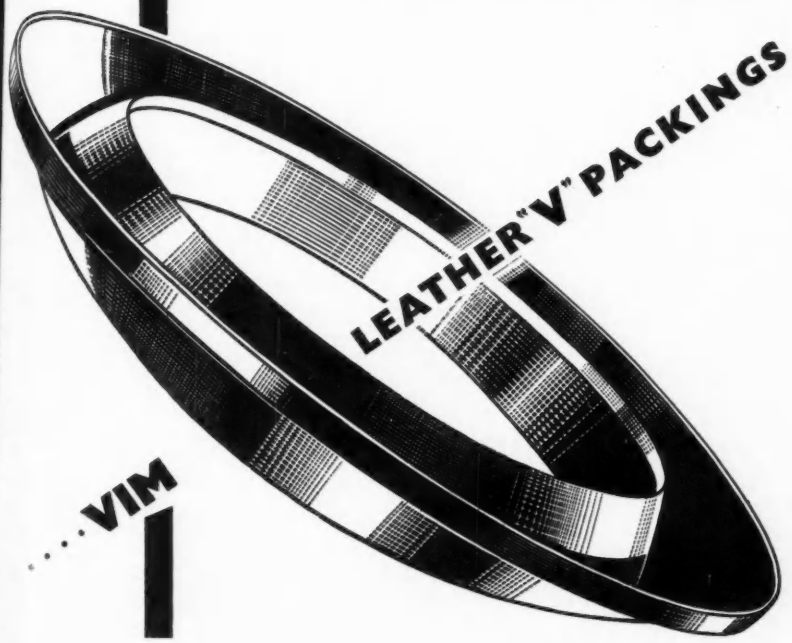

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J. Swan,
Secretary to the Board.

WEST MIDLANDS GAS BOARD

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